PROPOSITIONS

belonging to the thesis

COORDINATION NETWORKS UNDER NOISY MEASUREMENTS AND SENSOR BIASES

by

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1. For network consensus, bounded communication noise has the ability of disrupting the convergence to node agreement. It may also drive the state of nodes anywhere in sufficiently long time, which may be irrational in reality.

2. The adaptive threshold method can achieve practical consensus and ensure the bounded evolution of the consensus process, even when the communication suffers from unknown but bounded noise.

– Chapter 3

3. Saturating the received states of the neighbors can decouple the consensus error from the initial condition of the system and disentangle the bound on the node state from the noise.

– Chapter 4

4. As long as the nodes are able to get access to their own absolute states, it is possible to achieve practical consensus and ensure bounded system evolution.

– Chapters 3 and 4

5. When the measurement graph induced by the sensor network is not bipartite, even if all the sensors are biased, it is not difficult to estimate the biases and identify the biased sensors.

– Chapters 5

6. When the measurement graph is bipartite, to obtain an unbiased estimation of the biases, more than half of the sensors should be unbiased. When the biases are heterogeneous, they can be estimated even if the majority of the sensors are biased.

– Chapter 5

7. Doing research is a process of exploration, requiring the researchers to break the restrictions in their mind and set aside biases.